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PRODUCT CONTAINER WITH LOCKING END CAP**REPLACED BY
ART 34 AMDT****BACKGROUND OF THE INVENTION****Field of the Invention**

The present invention relates generally to the field of product packaging, and in particular to product containers having a locking end cap.

Description of the Prior Art

Product packaging serves a number of different functions, including: protecting the packaged product from accidental damage, attractively displaying the packaged product, and preventing theft or tampering. In addition, it is desirable for a package to be as inexpensive to manufacture as possible.

There is an ongoing need in the packaging industry for new package designs.

SUMMARY OF THE INVENTION

An aspect of the invention provides a package including a sleeve having at least one end defining an opening. The sleeve further includes at least one pair of locking tabs extending therefrom, each locking tab including a locking edge, each locking tab being folded into the opening. The package further includes a rigid end cap dimensioned to fit closely within the opening, the end cap including a rim designed so that, when the end cap is inserted into the opening, the rim engages the sleeve end and prevents the end cap from being inserted further into the opening. The end cap further includes a channel for receiving the pair of locking tabs, the channel having a ledge that engages the locking edge of each locking tab to prevent the end cap from being removed from the sleeve

opening. A further aspect of the invention provides a release mechanism for allowing an end cap to be removed without causing damage to the package.

Additional features and advantages of the present invention will become apparent by reference to the following detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a perspective view of a product package according to an aspect of the invention.

Figs. 2 and 3 show front and rear views of the package shown in Fig. 1.

Figs. 4 and 5 show left and right side views of the package shown in Fig. 1.

Figs. 6 and 7 show top and bottom views of the package shown in Fig. 1.

Figs. 8 and 9 show, respectively, elevation views of an upper and lower end cap according to an aspect of the invention.

Fig. 10 shows a plan view of a blank for fabricating a sleeve according to an aspect of the invention.

Fig. 11 shows a plan view of the blank shown in Fig. 10, partially fabricated into a sleeve.

Fig. 12A shows a plan view of the blank shown in Fig. 10, fully assembled into a sleeve.

Fig. 12B shows a side view of the blank shown in Fig. 12A.

Figs. 13A-D show a series of diagrams illustrating the operation of a locking mechanism according to an aspect of the invention.

Fig. 14 shows a cutaway view of a sleeve and end cap illustrating the operation of a locking mechanism according to an aspect of the invention.

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1. A package, comprising:

a sleeve including at least one end defining an opening, the sleeve including at least one locking tab extending therefrom, the locking tab including a locking edge, the locking tab being folded inwards into the opening; and

a rigid end cap including a substantially continuous outer surface that is dimensioned to fit closely within the opening, the end cap further including a rim overhanging the outer surface such that, when the end cap is inserted into the opening, the rim engages the sleeve end and prevents the end cap from being inserted further into the opening, the outer surface including at least one channel for receiving the locking tab, the channel having a ledge that engages the locking edge of the locking tab to prevent the end cap from being removed from the sleeve opening.
2. The package of claim 1, wherein the end cap includes a cavity shaped to receive an end of a product to be packaged.
3. The package of claim 2, wherein the end cap includes support ribs extending radially from the cavity to an interior wall of the end cap.
4. The package of claim 2, further including a second cavity shaped to receive a second end of a product to be packaged.
5. The package of claim 4, wherein the end cap includes support ribs extending radially from each cavity to an interior wall of the end cap.
6. The package of claim 5, wherein the end cap includes a support rib extending across the end cap, between the two cavities.

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7. The package of claim 1, wherein the channel is shaped such that the end cap is releasable by twisting the end cap relative to the sleeve.

8. The package of claim 7, wherein each of the locking tabs is trapezoidal and has an acute vertex that rides up a side edge of the channel when the end cap is twisted relative to the sleeve, such that the end cap is released from the sleeve.

9. The package of claim 8, wherein the channel has at least one ramped side edge, such that when the end cap is twisted relative to the sleeve, the locking tab rides up the ramped side edge, such that the end cap is released from the sleeve.

10. The package of claim 1, wherein the sleeve includes a second end defining a second opening, and wherein the package further comprises:

a second locking tab extending from the second end and folded inward into the second opening, the second locking tab having a locking edge;

a second end cap having a substantially continuous outer surface dimensioned to fit closely within the second opening, the second end cap including a rim overhanging the outer surface such that, when the second end cap is inserted into the second opening, the rim engages the second sleeve end and prevents the second end cap from being inserted further into the second opening, the second end cap including a channel for receiving the second locking tab, the channel having a ledge that engages the locking edge of the second locking tab to prevent the second end cap from being removed from the second sleeve opening.

11. An end cap, comprising:

a substantially continuous outer surface that is dimensioned to fit closely within an opening in a sleeve end;

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a rim overhanging the outer surface such that, when the end cap is inserted into the opening, the rim engages the sleeve end and prevents the end cap from being inserted further into the opening, the outer surface including at least one channel for receiving a locking tab extending from the sleeve, the channel having a ledge that engages the locking edge of the locking tab to prevent the end cap from being removed from the sleeve opening.

12. The end cap of claim 11, further including a cavity shaped to receive an end of a product to be packaged.

13. The end cap of claim 12, further including support ribs extending radially from the cavity to an interior wall of the end cap.

14. The end cap of claim 12, further including a second cavity shaped to receive a second end of a product to be packaged.

15. The end cap of claim 14, further including support ribs extending radially from each cavity to an interior wall of the end cap.

16. The end cap of claim 15, further including a support rib extending across the end cap, between the two cavities.

17. The end cap of claim 11, wherein the channel is shaped such that the end cap is releasable by twisting the end cap relative to the sleeve.

18. The package of claim 7, wherein the channel has at least one ramped side edge, such that when the end cap is twisted relative to the sleeve, the locking tab rides up the ramped side edge, such that the end cap is released from the sleeve.

19. A method for fabricating a package, comprising:

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- (a) cutting and scoring a sleeve blank to create first and second panels, a glue flap extending from the first panel, and locking tabs extending from each of the panels;
- (b) folding the second panel over the first panel;
- (c) folding the glue flap and affixing it to the second panel, the first and second panels forming a sleeve;
- (d) folding the locking tabs inward into the sleeve;
- (e) inserting a rigid end cap into a first end of the sleeve, the end cap including at least one channel having a ledge that engages a locking edge of each locking tab extending from the first end of the sleeve;
- (f) loading a product into the sleeve;
- (g) inserting a second rigid end cap into a second end of sleeve, the second end cap including at least one channel having a ledge that engages a locking edge of each locking tab extending from the second end of the sleeve.